Augmenting Organizational Knowledge Management Using Geographic Information Systems

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INTRODUCTION

Knowledge is the fundamental factor of production, and knowledge assets within an organization are in knowledge bases, databases, people's heads and filing cabinets (Mohajan, 2017). These assets are supposed to be managed in effective and efficient ways (Faucher, 2010). Organizations must continually rely on decisions, such as deciding on long-term plans, and on tactical schemes to realize middle range ambitions (Sado, 2014). In today's competitive world of business, knowledge management (KM) is of paramount importance for the sustainable development of organizations (Mahdi et al., 2011). Through KM, organizations collect and store potentially important knowledge and manipulate it to realize the utmost effective usage in order to positively change organizational performance (Singh et al., 2006). Through the application of successful KM, organizations can advance their effectiveness and can gain a competitive advantage (Rahimli, 2012). Many firms are realizing that to thrive in complex and dynamic environments, they must be swift and flexible in their day-to-day operations (Bolisani & Bratianu, 2017). Key decisions are now becoming more dependent on understanding and coding complex information acquired from knowledge management systems, and GIS technology has the ability to incorporate this requirement (Satyanarayana et al., 2017). GIS offers a framework for planners to devise things more efficiently (Belsis et al., 2004). GIS is a computing application capable of creating, storing, manipulating, visualizing, analyzing and interpreting geographical data (Gürder & Yılmaz, 2013). GIS shows relationships (of proximity, connectivity, neighbourhood, and overlay), patterns, and trends in the form of maps, reports, and charts (ESRI, 2012). GIS is used for explaining events, predicting outcomes, and planning strategies (ESRI, 2000). Thus, GIS technology guarantees faster decision making (Al-Fareed et al., 2008). It can assist businesses to save time and money while improving access to information and realizing a tangible return on their GIS investment (Klimešová & Vostrovský, 2008).

BACKGROUND

The contemporary beginnings of KM can be traced back to the late 1980s, through to the 1990s (Edwards et al., 2009). The KM concept was first applied in fields, such as information systems, business administration, healthcare, public policy, and library and information sciences (Bennet & Bennet 2008). It is assumed that approximately 80 per cent of data employed in creating information and knowledge in

DOI: 10.4018/978-1-7998-3473-1.ch036

organizations have spatial components (Fitzke & Greve, 2010). Thus, spatial-based information systems can significantly contribute to effective knowledge management activities (Gürder & Yılmaz, 2013). GIS technology can link geographical datasets by use of spatial references through a process known as geocoding (Gürder & Yılmaz, 2013). The spatial reference can be given by coordinates (Nikolli & Idrizi, 2010). Therefore, addresses can be correctly located on a map with the help of the address coordinates (Zandbergen, 2007). According to Strand (2016), "This kind of references allows the observations to be linked by location, providing for new approaches to data collection, new opportunities for data analysis and more use of maps as a visualization and communication tool." Thus, by applying GIS-functions more information will be generated, information which will allow businesses to conduct analyses, and to carry out new queries and assessments on particular problems (Gürder & Yılmaz, 2013). Non-spatial (attribute) data describe the properties of spatial entities (Gürder & Yılmaz, 2013). The salary and/or age, for example, of a shopper living at a particular address, are attribute data. The address remains a geographical data. A geodatabase warrants that geographical data and attribute data are connected to each other (Gürder & Yılmaz, 2013). The GIS capability to perform spatial analysis can be considered to be the same as the decision capabilities of decision support systems (DSS) (Mennecke, 1996). This enhances their distinguished significance to support basic organizational tasks (Belsis et al., 2004). Thus, spatial-based information systems will contribute to operational knowledge management activities (Gürder & Yılmaz, 2013).

KNOWLEDGE AND KNOWLEDGE MANAGEMENT

Defining Knowledge and Knowledge Management

Knowledge is linked to human actions (Tsoukas & Vladimirou, 2001). It lives in people in terms of information, experiments, perceptiveness and qualifications, products/services, and as activities and processes (Chuang et al., 2013). According to Almashari et al. (2002), knowledge is the ability to act. Wang et al. (2007) defined knowledge as the capability to change information into actions and decisions. In organizations, there are two types of knowledge, namely explicit and tacit knowledge (Nonaka, 1991). Encoded, stored and disseminated data and information are regarded as a content component of the explicit knowledge (Mahmood et al. 2011). Tacit knowledge articulates itself in actions of humans as evaluations, attitudes, competencies, points of view, experiences and skills inside the worldview of an individual (Koskinen et al, 2003). Various definitions of KM exist. Druker (1999) defined knowledge management as "the coordination and exploitation of the cognitive resources of an organisation in order to create the benefit and competitive advantage." Dalkir et al. (2007) define knowledge management as "Processes and activities which support and facilitate the development and the use of knowledge." Knowledge management generally entails the planning, organizing, motivating, and controlling of people, processes and systems in an organization to guarantee that its knowledge-related assets are improved and effectively applied so as to attain efficiency, to gain competitive advantage and to guarantee innovation.

Knowledge Management Processes in an Organization

Probst et al. (1997) recognized eight processes in KM in an organization; these processes were regarded as "the building blocks of knowledge management". Knowledge goals come first, and they pave the way for knowledge management activities. According to Probst et al. (1997), knowledge goals can be